10-30-2008

Ex. 277-US-456

Unknown

Stream: Williamson
Site: 638 (Irving Creek)

Date: 5/10/1993
Habitat: Run **Flow:** High

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	4.37	104.37		
HP1			7.99	96.38
HP2			5.76	98.61
HP3			6.25	98.12
TP				
HP3	5.06	103.18		
HP2			4.58	98.60
HP1			6.80	96.38
BM			3.18	100.00

Comment:

(2) Water Surface Elevation (WSE) Survey

	L/R WSE	Sta (ft)	HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
TR1	LWSE	0	103.18	8.57	0.00	94.61	94.60	1.5
	RWSE			8.59	0.00	94.59		
TR2	LWSE	25.8	103.18	7.05	0.00	96.13	96.12	
	RWSE			7.07	0.00	96.11		
TR3	LWSE	30.7	103.18	7.03	0.00	96.15	96.13	
	RWSE			7.07	0.00	96.11		
							Ave Q=	1.5

Note:
WSE slope = 4.984%

Date: 6/23/1993
Habitat: Run **Flow:** Low

(1) Level Loop Survey

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	4.64	104.64		
HP1			8.25	96.39
HP2			6.04	98.60
HP3			6.52	98.12
TP				
HP3	6.36	104.48		
HP2			5.89	98.59
HP1			8.10	96.38
BM			4.48	100.00

Comment:

(2) Water Surface Elevation (WSE) Survey

	L/R WSE	Sta (ft)	HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
TR1	LWSE	0	104.48	9.85	0.00	94.63	94.67	1.3
	RWSE			9.78	0.00	94.70		
TR2	LWSE	25.8	104.48	8.31	0.00	96.17	96.17	1.1
	RWSE			8.32	0.00	96.16		
TR3	LWSE	30.7	104.48	8.49	0.00	95.99	96.00	1.3
	RWSE			8.47	0.00	96.01		
							Ave Q=	1.2

Note:
WSE slope = 4.349%

Date: 9/19/1993
Habitat: Run **Flow:** Mid

(1) Level Loop Survey (BM & HP)

BM/HP (ft)	BS (ft)	HI (ft)	FS (ft)	Elev (ft)
BM	4.51	104.51		
HP1			8.13	96.38
HP2			5.91	98.60
HP3			6.39	98.12
TP				
HP3	6.17	104.29		
HP2			5.69	98.60
HP1			7.92	96.37
BM			4.30	99.99

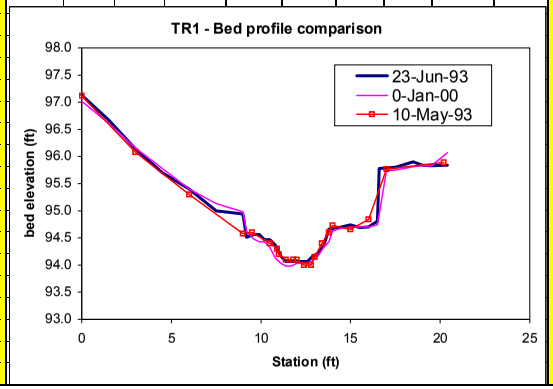
Comment:

(2) Water Surface Elevation (WSE) Survey

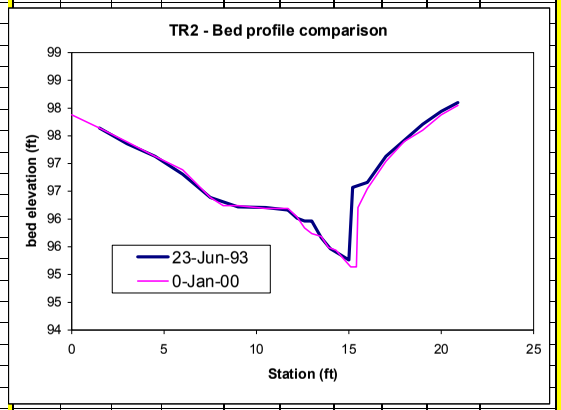
	L/R WSE	Sta (ft)	HI (ft)	FS (ft)	Rod (ft)	WSE (ft)	Ave WSE (ft)	Q (cfs)
TR1	LWSE	0	104.29	9.67	0.00	94.62	94.63	1.3
	RWSE			9.65	0.00	94.64		
TR2	LWSE	25.8	104.29	8.02	0.00	96.27	96.24	1.2
	RWSE			8.08	0.00	96.21		
TR3	LWSE	30.7	104.29	7.90	0.00	96.39	96.27	1.5
	RWSE			8.15	0.00	96.14		
							Ave Q=	1.3

Note:
WSE slope = 5.326%

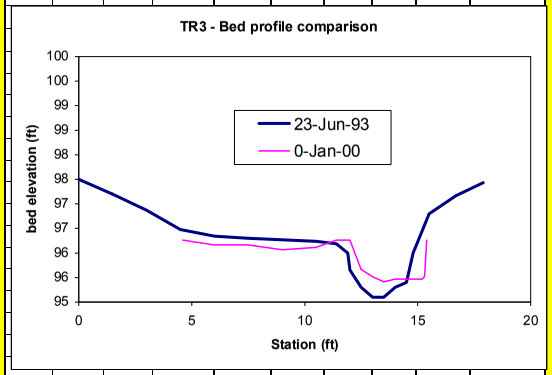
Stream:	Williamson		10-May-93										23-Jun-93										0-Jan-00									
Site:	638			Sta	FS	Ground	Depth	Vel (ft/s)			q			Sta	FS	Ground	Depth	Vel (ft/s)			q			Sta	FS	Ground	Depth	Vel (ft/s)			q	
Transect:	1			(ft)	(ft)	(ft)	(ft)	$V_{0.2/0.6}$	$V_{0.8}$	Ave	(cfs)	substrate		(ft)	(ft)	(ft)	(ft)	$V_{0.2/0.6}$	$V_{0.8}$	Ave	(cfs)	substrate		(ft)	(ft)	(ft)	(ft)	$V_{0.2/0.6}$	$V_{0.8}$	Ave	(cfs)	substrate
Habitat:	Run																															
Survey	HI	Q	LWP	0.0	6.06	97.12							LWP	0.0	7.35	97.13								0.0	7.27	97.02						1.1
Date	(ft)	(cfs)		3.0	7.10	96.08								1.5	7.81	96.67								1.5	7.68	96.61						1.1
5/10/1993	103.18	1.5		6.0	7.88	95.30								3.0	8.34	96.14								3.0	8.13	96.16						1.1
6/23/1993	104.48	1.3		9.0	8.60	94.58								4.5	8.78	95.70								4.5	8.51	95.78						1.1
1/0/1900	104.29	1.3	LWE	9.5		94.60	0.00	0.00		0.00	0.00	2.2		6.0	9.08	95.40								6.0	8.89	95.40						1.1
				10.5		94.40	0.20	0.74		0.74	0.10	3.3		7.5	9.48	95.00								7.5	9.16	95.13						1.1
				10.9		94.30	0.30	1.25		1.25	0.09	4.4		9.0	9.54	94.94								9.0	9.31	94.98						1.1
				11.0		94.20	0.40	1.08		1.08	0.11	3.3	LWE	9.2		94.52	0.15	0.01		0.01	0.00		LWE	9.2	9.67	94.62	0.00					1.1
				11.4		94.10	0.50	1.13		1.13	0.23	3.3		9.6		94.57	0.10	0.01		0.01	0.00			9.6		94.48	0.15	0.05		0.05	0.00	1.1
				11.8		94.10	0.50	1.23		1.23	0.18	3.3		9.9		94.57	0.10	0.10		0.10	0.00			9.9		94.43	0.20	0.04		0.04	0.00	1.1
				12.0		94.10	0.50	1.17		1.17	0.18	4.4		10.2		94.47	0.20	0.10		0.10	0.01			10.2		94.43	0.20	0.05		0.05	0.00	1.1
				12.4		94.00	0.60	1.30		1.30	0.31	4.4		10.5		94.47	0.20	0.15		0.15	0.01			10.5		94.33	0.30	-0.23		-0.23	-0.02	1.1
				12.8		94.00	0.60	1.19		1.19	0.21	4.4		10.8		94.37	0.30	0.95		0.95	0.09			10.8		94.13	0.50	0.59		0.59	0.09	1.1
				13.0		94.15	0.45	0.75		0.75	0.10	4.4		11.1		94.17	0.50	1.20		1.20	0.18			11.1		94.03	0.60	0.97		0.97	0.17	3.4
				13.4		94.40	0.20	0.27		0.27	0.02	4.4		11.4		94.07	0.60	1.00		1.00	0.18			11.4		93.98	0.65	0.88		0.88	0.17	3.4
			RWE	13.8		94.60	0.00	0.00		0.00	0.00	4.4		11.7		94.07	0.60	1.00		1.00	0.18			11.7		93.98	0.65	0.92		0.92	0.18	3.4
				14.0	8.45	94.73								12.0		94.07	0.60	1.00		1.00	0.18			12.0		94.03	0.60	0.88		0.88	0.16	3.4
				15.0	8.52	94.66								12.3		94.07	0.60	1.10		1.10	0.20			12.3		94.03	0.60	0.91		0.91	0.16	3.4
				16.0	8.34	94.84								12.6		94.07	0.60	0.70		0.70	0.13			12.6		94.03	0.60	0.85		0.85	0.15	3.4
				17.0	7.41	95.77								12.9		94.17	0.50	0.50		0.50	0.08			12.9		94.08	0.55	0.71		0.71	0.12	3.4
			RWP	20.2	7.29	95.89								13.2		94.22	0.45	0.40		0.40	0.05			13.2		94.18	0.45	0.43		0.43	0.06	3.4
														13.5		94.37	0.30	0.20		0.20	0.02			13.5		94.33	0.30	0.22		0.22	0.02	1.1
													RWE	13.8		94.67	0.00	0.00		0.00	0.00			13.8		94.43	0.20	0.14		0.14	0.01	1.1
														14.5	9.78	94.70							RWE	14.0		94.63	0.00	0.00		0.00	0.00	1.1
														15.0	9.74	94.74								14.5	9.61	94.68						1.1
														15.5	9.79	94.69								15.0	9.60	94.69						1.1
														16.0	9.78	94.70								15.5	9.59	94.70						1.1
														16.5	9.67	94.81								16.0	9.59	94.70						1.1
														16.6	8.70	95.78								16.5	9.55	94.74						1.1
														17.0	8.69	95.79								17.0	8.55	95.74						1.1
														17.5	8.68	95.80								17.5	8.54	95.75						1.1
														18.0	8.63	95.85								18.0	8.51	95.78						1.1
														18.5	8.58	95.90								18.5	8.48	95.81						1.1
														19.0	8.64	95.84								19.0	8.46	95.83						1.1
														19.5	8.65	95.83								19.5	8.46	95.83						1.1
														20.4	8.64	95.84								20.4	8.22	96.07						1.1



Stream:	Williamson		10-May-93										23-Jun-93										0-Jan-00									
Site:	638			Sta	FS	Ground	Depth	Vel (ft/s)			q			Sta	FS	Ground	Depth	Vel (ft/s)			q			Sta	FS	Ground	Depth	Vel (ft/s)			q	
Transect:	2			(ft)	(ft)	(ft)	(ft)	$V_{0.2/0.6}$	$V_{0.8}$	Ave	(cfs)	substrate		(ft)	(ft)	(ft)	(ft)	$V_{0.2/0.6}$	$V_{0.8}$	Ave	(cfs)	substrate		(ft)	(ft)	(ft)	(ft)	$V_{0.2/0.6}$	$V_{0.8}$	Ave	(cfs)	substrate
Habitat:	Run																															
													LWP	0.0	6.61	97.87																
Survey	HI	Q												1.5	6.84	97.64								0.0	6.41	97.88						1.1
Date	(ft)	(cfs)												3.0	7.12	97.36								1.5	6.65	97.64						1.1
5/10/1993	103.18													4.5	7.35	97.13								3.0	6.90	97.39						1.1
6/23/1993	104.48	1.1												6.0	7.67	96.81								4.5	7.16	97.13						1.1
1/0/1900	104.29	1.2												7.5	8.09	96.39								6.0	7.40	96.89						1.1
														9.0	8.26	96.22								7.5	7.90	96.39						1.1
														10.5	8.27	96.21							LEW	8.2		96.24	0.00	0.00		0.00	0.00	1.1
													LWE	11.7		96.17	0.00	0		0.00	0.00			9.0		96.24	0.00	0.01		0.01	0.00	1.1
														12.2		96.02	0.15	0.2		0.20	0.01			10.5		96.19	0.05	0.01		0.01	0.00	1.1
														12.6		95.97	0.20	0.4		0.40	0.03			11.7		96.19	0.05	0.01		0.01	0.00	1.1
														13.0		95.97	0.20	0.2		0.20	0.02			12.2		96.04	0.20	0.41		0.41	0.04	1.1
														13.5		95.67	0.50	0.4		0.40	0.10			12.6		95.84	0.40	0.15		0.15	0.02	3.2
														14.0		95.47	0.70	0.60		0.60	0.21			13.0		95.74	0.50	0.35		0.35	0.08	3.2
														14.5		95.37	0.80	0.90		0.90	0.36			13.5		95.69	0.55	0.34		0.34	0.08	3.3
														15.0		95.27	0.90	1.10		1.10	0.35			13.9		95.49	0.75	0.49		0.49	0.15	3.3
													RWE	15.2	7.91	96.57								14.3		95.44	0.80	0.51		0.51	0.16	3.3
														16.0	7.82	96.66								14.7		95.29	0.95	0.50		0.50	0.19	3.3
														17.0	7.35	97.13								15.1		95.14	1.10	0.72		0.72	0.28	3.3
														19.0	6.77	97.71								15.4		95.14	1.10	0.85		0.85	0.19	3.3
														20.0	6.54	97.94							RWE	15.5	8.08	96.21						1.1
													RWP	20.9	6.38	98.10								16.0	7.74	96.55						1.1
																								17.0	7.25	97.04						1.1
																								18.0	6.89	97.40						1.1
																								19.0	6.69	97.60						1.1
																								20.0	6.41	97.88						1.1
																								20.9	6.24	98.05						1.1



Stream:	Williamson		10-May-93										23-Jun-93										0-Jan-00									
Site:	638			Sta	FS	Ground	Depth	Vel (ft/s)			q			Sta	FS	Ground	Depth	Vel (ft/s)			q			Sta	FS	Ground	Depth	Vel (ft/s)			q	
Transect:	3			(ft)	(ft)	(ft)	(ft)	$V_{0.2/0.6}$	$V_{0.8}$	Ave	(cfs)	substrate		(ft)	(ft)	(ft)	(ft)	$V_{0.2/0.6}$	$V_{0.8}$	Ave	(cfs)	substrate		(ft)	(ft)	(ft)	(ft)	$V_{0.2/0.6}$	$V_{0.8}$	Ave	(cfs)	substrate
Habitat:	Run																															
													LWP	0.0	6.98	97.50															
Survey	HI	Q												1.5	7.28	97.20								0.0							1.1
Date	(ft)	(cfs)												3.0	7.61	96.87								1.5							1.1
5/10/1993	103.18													4.5	8.00	96.48								3.0							1.1
6/23/1993	104.48	1.3												6.0	8.14	96.34							RWE	4.6		96.27	0.00	0.00		0.00	0.00	1.1
1/0/1900	104.29	1.5												7.5	8.18	96.30								6.0		96.17	0.10	1.09		1.09	0.16	1.1
														9.0	8.21	96.27								7.5		96.17	0.10	0.09		0.09	0.01	1.1
														10.5	8.24	96.24								9.0		96.07	0.20	0.14		0.14	0.04	1.1
														11.4	8.29	96.19								10.5		96.12	0.15	0.22		0.22	0.04	1.1
													LWE	11.9		96.00	0.00	0.00		0.00	0.00			11.4		96.27	0.00	0.01		0.01	0.00	1.1
														12.0		95.65	0.35	0.20		0.20	0.02			11.9		96.27	0.00	0.01		0.01	0.00	1.1
														12.5		95.30	0.70	0.40		0.40	0.14			12.0		96.27	0.00	0.01		0.01	0.00	1.1
														13.0		95.10	0.90	1.10		1.10	0.50			12.5		95.67	0.60	0.37		0.37	0.11	3.3
														13.5		95.10	0.90	1.00		1.00	0.45			13.0		95.52	0.75	0.53		0.53	0.20	3.3
														14.0		95.30	0.70	0.10		0.10	0.04			13.5		95.42	0.85	0.26		0.26	0.11	3.3
														14.5		95.40	0.60	0.80		0.80	0.19			14.0		95.47	0.80	0.57		0.57	0.23	3.3
													RWE	14.8		96.00	0.00	0.00		0.00	0.00			14.5		95.47	0.80	0.08		0.08	0.03	3.3
														15.5	7.68	96.80								14.8		95.47	0.80	0.73		0.73	0.15	3.3
														16.7	7.31	97.17								15.0		95.47	0.80	1.01		1.01	0.16	3.3
													RWP	17.9	7.05	97.43								15.2		95.47	0.80	1.32		1.32	0.16	3.3
																								15.3		95.52	0.75	1.35		1.35	0.10	3.3
																							WE	15.4		96.27	0.00	0.00		0.00	0.00	1.1



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     Williamson River WM15 09/19/93
RUN                          MID                                    TRANSECT 1
IOC       11011001000010001010000
QARD   0.5
QARD   0.6
QARD   0.7
QARD   0.8
QARD   0.9
QARD   1.0
QARD   1.1
QARD   1.2
QARD   1.3
QARD   1.4
QARD   1.5
QARD   1.6
QARD   1.7
QARD   1.8
QARD   2.0
QARD   2.1
QARD   2.2
QARD   2.3
QARD   2.4
QARD   2.5
QARD   2.6
QARD   2.7
QARD   2.8
QARD   2.9
QARD   3.0
QARD   3.1
QARD   3.2
QARD   3.3
QARD   3.4
QARD   3.5
XSEC1000.0      0.00 1.0     94.07  0.053260
    1000.0  0.097.02  1.596.61  3.096.16  4.595.78  6.095.40  7.595.13
    1000.0  9.094.98  9.294.62  9.694.48  9.994.43 10.294.43 10.594.33
    1000.0 10.894.13 11.194.03 11.493.98 11.793.98 12.094.03 12.394.03
    1000.0 12.694.03 12.994.08 13.294.18 13.594.33 13.894.43 14.094.63
    1000.0 14.594.68 15.094.69 15.594.70 16.094.70 16.594.74 17.095.74
    1000.0 17.595.75 18.095.78 18.595.81 19.095.83 19.595.83 20.496.07
NS  1000.0       1.1       1.1       1.1       1.1       1.1       1.1
NS  1000.0       1.1 1.    1.1 1.    1.1 1.    1.1 1.    1.1       1.1
NS  1000.0       1.1       3.4       3.4       3.4       3.4       3.4
NS  1000.0       3.4       3.4       3.4 0.5   1.1 0.55  1.1       1.1
NS  1000.0       1.1       1.1       1.1       1.1       1.1       1.1
NS  1000.0       1.1       1.1       1.1       1.1       1.1       1.1
WSL 1000.0     94.44     94.48     94.50     94.53     94.55     94.57
WSL 1000.0     94.59     94.61     94.63     94.66     94.68     94.71
WSL 1000.0     94.76     94.77     94.79     94.79     94.81     94.81
WSL 1000.0     94.82     94.83     94.84     94.85     94.86     94.87
WSL 1000.0     94.88     94.89     94.89     94.90     94.91     94.93
CAL11000.0     94.63     1.300
VEL11000.0                                            0.05 0.04 0.05 -.23
VEL11000.0 0.59 0.97 0.88 0.92 0.88 0.91 0.85 0.71 0.43 0.22 0.14 0.00
VEL11000.0
CAL21000.0     94.63     1.301
VEL21000.0
VEL21000.0
VEL21000.0
CAL31000.0     94.63     1.302
VEL31000.0
VEL31000.0
VEL31000.0
ENDJ
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     Williamson River WM15 09/19/93
RUN                          MID                                    TRANSECT 2
IOC       11011001000010001010 00
QARD   0.5
QARD   0.6
QARD   0.7
QARD   0.8
QARD   0.9
QARD   1.0
QARD   1.1
QARD   1.2
QARD   1.3
QARD   1.4
QARD   1.5
QARD   1.6
QARD   1.7
QARD   1.8
QARD   2.0
QARD   2.1
QARD   2.2
QARD   2.3
QARD   2.4
QARD   2.5
QARD   2.6
QARD   2.7
QARD   2.8
QARD   2.9
QARD   3.0
QARD   3.1
QARD   3.2
QARD   3.3
QARD   3.4
QARD   3.5
XSEC1000.0      0.00 1.0     95.27  0.053260
    1000.0  0.097.88  1.597.64  3.097.39  4.597.13  6.096.89  7.596.39
    1000.0  8.296.24  9.096.24 10.596.19 11.796.19 12.296.04 12.695.84
    1000.0 13.095.74 13.595.69 13.995.49 14.395.44 14.795.29 15.195.14
    1000.0 15.495.14 15.596.21 16.096.55 17.097.04 18.097.40 19.097.60
    1000.0 20.097.88 20.998.05
NS  1000.0       1.1       1.1       1.1       1.1       1.1       1.1
NS  1000.0       1.1       1.1 1.5   1.1 1.5   1.1 .32   1.1       3.2
NS  1000.0       3.2       3.3       3.3       3.3       3.3       3.3
NS  1000.0 .5    3.3 .5    1.1       1.1       1.1       1.1       1.1
NS  1000.0       1.1       1.1
WSL 1000.0     95.84     95.89     95.93     95.97     96.01     96.05
WSL 1000.0     96.09     96.12     96.24     96.27     96.29     96.31
WSL 1000.0     96.32     96.34     96.35     96.37     96.38     96.39
WSL 1000.0     96.41     96.42     96.43     96.44     96.46     96.47
WSL 1000.0     96.48     96.49     96.50     96.51     96.53     96.55
CAL11000.0     96.24     1.300
VEL11000.0                                0.00 0.01 0.01 0.01 0.41 0.15
VEL11000.0 0.35 0.34 0.49 0.51 0.50 0.72 0.85
VEL11000.0
CAL21000.0     96.24     1.301
VEL21000.0
VEL21000.0
VEL21000.0
CAL31000.0     96.24     1.209
VEL31000.0
VEL31000.0
VEL31000.0
ENDJ
```

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     Williamson River WM15 09/19/93
RUN                          MID                                    TRANSECT 3
IOC       1101100100001000101000
QARD   0.5
QARD   0.6
QARD   0.7
QARD   0.8
QARD   0.9
QARD   1.0
QARD   1.1
QARD   1.2
QARD   1.3
QARD   1.4
QARD   1.5
QARD   1.6
QARD   1.7
QARD   1.8
QARD   2.0
QARD   2.1
QARD   2.2
QARD   2.3
QARD   2.4
QARD   2.5
QARD   2.6
QARD   2.7
QARD   2.8
QARD   2.9
QARD   3.0
QARD   3.1
QARD   3.2
QARD   3.3
QARD   3.4
QARD   3.5
XSEC1000.0      0.00 1.0     95.42  0.053260
    1000.0  0.097.50  1.597.20  3.096.87  4.596.48  6.096.17  7.596.17
    1000.0  9.096.07 10.596.12 11.496.27 11.996.27 12.096.27 12.595.67
    1000.0 13.095.52 13.595.42 14.095.47 14.595.47 14.895.47 15.095.47
    1000.0 15.295.47 15.395.52 15.496.27 16.797.17 17.997.43
NS  1000.0       1.1       1.1       1.1       1.1 0.60  1.1 .5    1.1
NS  1000.0 .50   1.1       1.1       1.1       1.1       1.1       3.3
NS  1000.0       3.3       3.3       3.3 1.2   3.3       3.3       3.3
NS  1000.0       3.3       3.3 .35   1.1       1.1       1.1
WSL 1000.0     95.88     95.93     95.98     96.02     96.08     96.21
WSL 1000.0     96.23     96.25     96.27     96.29     96.31     96.32
WSL 1000.0     96.34     96.35     96.38     96.39     96.41     96.42
WSL 1000.0     96.43     96.44     96.45     96.47     96.48     96.49
WSL 1000.0     96.50     96.51     96.52     96.53     96.54     96.55
CAL11000.0     96.27     1.300
VEL11000.0                0.00 1.09 0.09 0.14 0.22 0.01 0.01 0.01 0.37
VEL11000.0 0.53 0.26 0.57 0.08 0.73 1.01 1.32 1.35 0.00
CAL21000.0     96.27     1.301
VEL21000.0
VEL21000.0
CAL31000.0     96.27     1.209
VEL31000.0
VEL31000.0
ENDJ
```